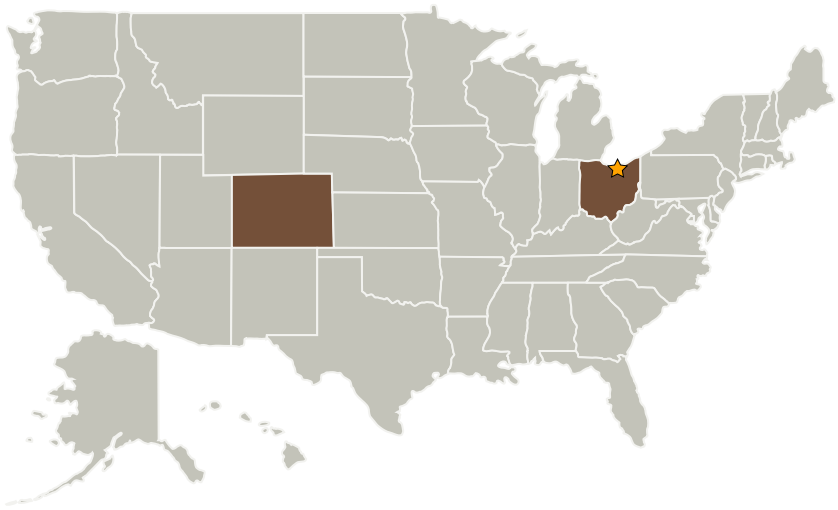
Methods to Remove Coke from Endothermic Heat Exchangers, Phase I

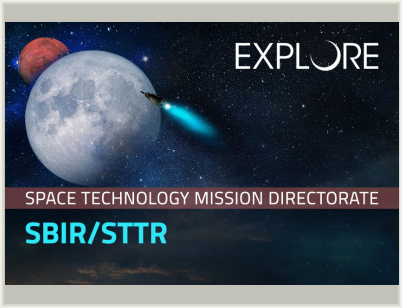
Completed Technology Project (2004 - 2004)

Project Introduction

Currently the United States space program is recognized as the world leader in providing access to space. However, in order to maintain this position, it will be necessary to reduce the very high cost of reaching low Earth orbit by using single stage or two stage to orbit vehicles. Some components of these vehicles have exceptionally high heat loads and require additional cooling capacity, which can be accommodated by utilizing the additional fuel heat sink capacity available from endothermic cracking reactions. Unfortunately, cracking reactions lead to coke deposition in the heat exchanger, which can be a potentially serious problem if it is allowed to accumulate. Therefore in this Phase I proposal, TDA Research, Inc. (TDA) will develop methods to remove the coke from the heat exchanger flow path. Previously, several different coke formation mechanisms were though to occur during cracking and the selection of an appropriate method to remove the coke would depend on the mechanism responsible. However, as a result of previous work, we have identified the mechanism primarily responsible for coke deposition with JP-7 and JP-8. Thus, the methods we develop in this SBIR Phase I proposal have a high probability of success.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
TDA Research, Inc.	Supporting Organization	Industry	Wheat Ridge, Colorado

Primary U.S. Work Locations	
Colorado	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

David Wickham

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.1 Heat Acquisition